ATTACHMENT 1

SITE INSPECTION REPORT/MEMORANDUM

MEMORANDUM

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
BLUE RIDGE REGIONAL OFFICE - LYNCHBURG
WATER DIVISION

7705 Timberlake Road Lynchburg, VA 24502

SUBJECT: SITE INSPECTION – TOWN OF FARMVILLE WWTP, VPDES PERMIT # VA0083135

TO: Kip Foster, Water Permits Manager - BRRO

FROM: Kirk Batsel, Sr. Environmental Engineer – BRRO - Lynchburg

DATE: March 3, 2009

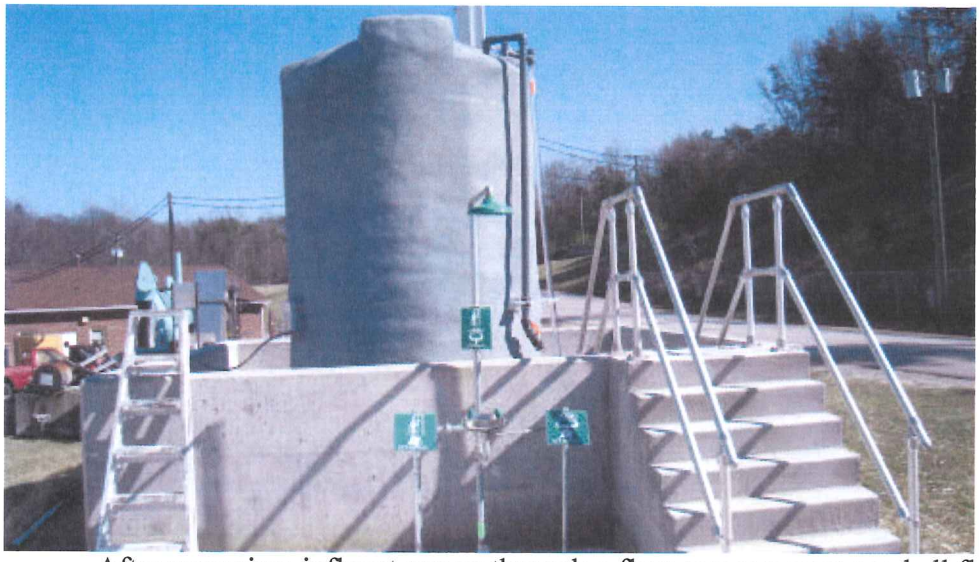
COPIES: Permit file

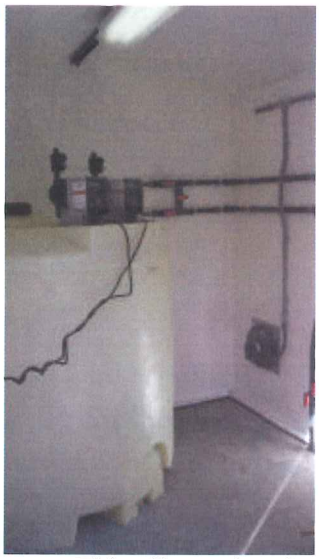
A site inspection was held at the subject facility on Tuesday February 23, 2009 in support of the upcoming VPDES permit reissuance. I arrived on-site at approximately 2:00 pm and subsequently met with Sandy Meador, Chief Operator. We initially discussed the permit reissuance process. We then toured the facility starting at the plant headworks and progressed thru each unit process. The plant is in the process, and nearing completion, of upgrading treatment processes to remove effluent nutrients (nitrogen and phosphorous).

The tour began at the influent screw pump lift system. Influent is lifted at this point and then passes through the plant via gravity flow. The plant was initially designed and constructed in 1994, with the potential for expansion to 5 MGD, whenever future needs dictate. The current design flow is 2.4 MGD. Unit process photos were taken as below. Note the idle lift channel where a third screw pump lift can be added.

Once the wastewater is lifted, it passes through the screening and grit removal unit process, where debris, grit, and rags are removed from the raw wastewater.

New equipment at the plant includes two tanks (Below Left: Gray tank for bulk transfer and storage, Below Right: White tank is for day use blending). These tanks will be utilized for storage and blending of a precipitant, such as ferric chloride, to enhance removal of phosphorus. The tanks have just been installed, as part of the nutrient removal upgrade and will be coming online in the near future.

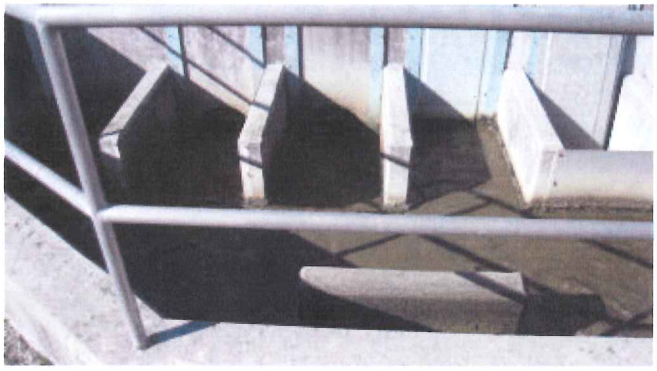




After screening, influent passes through a flow measurement parshall flume. This allows the plant operator to have real time data on flow coming into the plant. Influent flow at the time of inspection (2:15 pm) was 1.374 MGD.

Hydrated lime is then added to the influent to assist with nitrogen removal. Hydrated lime is stored in a vertical tank, and is added to the influent on a flow-proportional basis.

Influent is then routed to the plants splitter box, which is intended to direct flow into one or both of the facility's aerated basins (activated sludge basin). The splitter box separates flow between three (3) inlet pipes per basin.



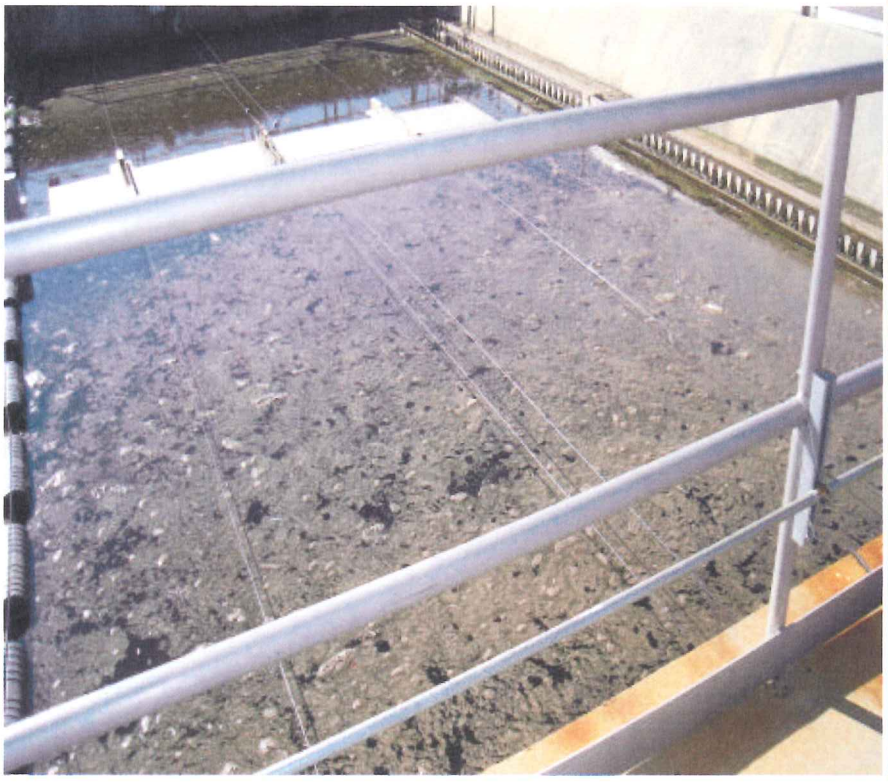
At present, the facility has been utilizing only one, of the two existing, aerated basins. Amazingly, the plant was constructed in 1994 with two basins available for activated sludge treatment. Each of the basins are designed to contain 2.4 million gallons are 14 feet deep. Until present, and based on flow, it has only been necessary to operate one activated sludge basin. However, with the nutrient reduction upgrade, the plant is gearing up to begin utilizing both basins by the end of March 2009. The use of both basins will increase the hydraulic retention time from $\geq$ 2 days to 3 days. The basins are to be operated using the Parkson Wave-Ox system, which alternates aerobic and anaerobic zones to reduce effluent nitrogen concentrations.

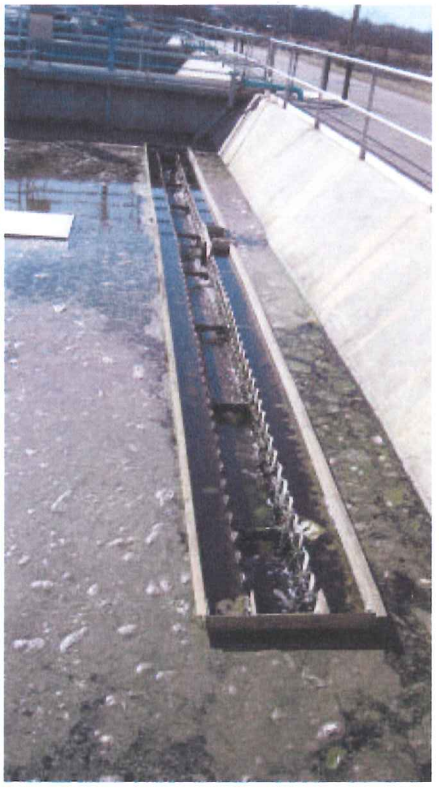
Basin #1, above left, and basin #2, above right, have been converted to the wave-ox system. Note that the first two zones in basin #1 are quiescent while other zones are being aerated. The control system (panel below) is housed in the adjacent pump house and is automated.

Note the colored zones on the panel pictured above, indicating aerobic/anaerobic zones

Air is provided to the activated sludge basins by the three blower pumps pictured below.

Each of the two basins, have a square secondary clarifier. On the day of inspection, floating scum was noted. Each basin also has a mechanical skimmer controlled by the cables, pictured. Supernatant is discharged via the longitudinal v-notch weir system.





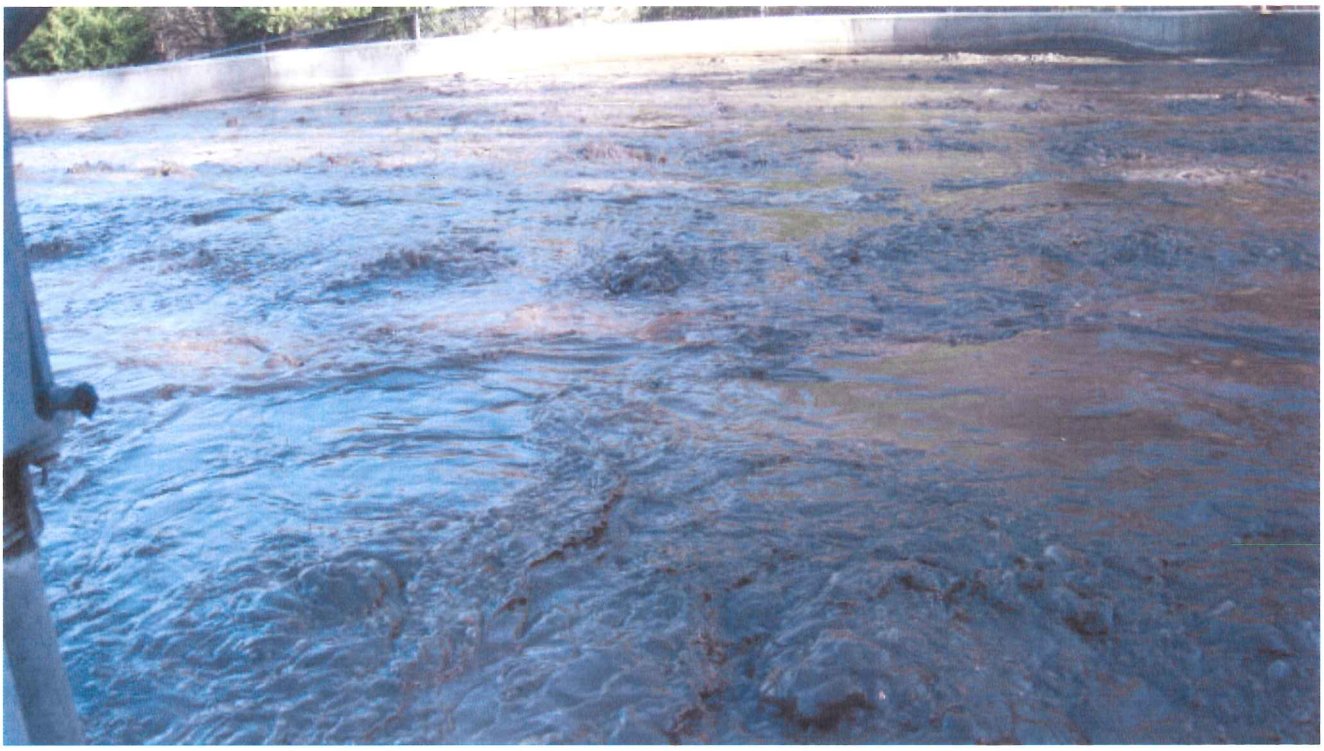
Secondary effluent is then routed thru the sand filter polishing unit process. This provides additional polishing of the secondary effluent to remove any remaining solids which also will reduce chlorine demand. On the day of inspection, the sand filters were being bypassed, in order to perform maintenance. Sludge from the secondary clarifiers is routed to both the splitter box upstream of the aeration basins (return flow) or to one of the two (2) sludge digesters. Pictured below is the sand filter and sand filter control panel.

Next, the effluent is routed thru the plant's chlorine contact chamber. The plant uses gaseous chlorine and gaseous sulfur dioxide for chlorination, and dechlorination, respectively.

The disinfected effluent is then routed thru the final effluent parshall flume for flow monitoring, and then on to the facility's step-aeration. Compliance effluent samples are collected using an Isco sampler, which has just been replaced with a modern version. This unit keeps the sample chilled and allows for composite sampling.

The effluent flows from step-aeration to the Appomattox River via an underground pipe. The discharge pipe has a flapper type cover that keeps river water out, during high flow periods.

Sludge management includes, the use of two (2) digesters where the sludge is thickened. Once the sludge is adequately treated, it is pumped to one of a series of three final sedimentation lagoons. Sludge from these lagoons is periodically pumped out for ultimate land disposal under appropriate BUR or DEQ permits. Notice the good color of sludge in the digester.



This completed my site visit. I would like to thank Sandy Meador, Chief Operator, for his assistance during this plant tour.